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THE RELATION OF SCIENCE TO CONCRETE EXPERIENCE.

TO what degree, if at all, do the sciences bring before us reality in its concreteness ? is a question which has of late years been discussed in many ways. The answers are various, according to the peculiarities of the schools from which they come. One replies that the scientific account of things is partial and abstract ; another, that science is a tool, and its results are true only in an economic sense ; still another, that scientific reasoning is confessedly mediate, while we get at reality only in immediate experience. All, however, seem to agree that the sciences, and especially the natural sciences, are abstract, and even artificial, and the epistemologists are the more unanimous in this opinion because the scientists themselves — at least those who raise the question — also hold it, if one excepts such adherents of Newtonian realism as Lord Kelvin and Sir Arthur Rücker.[1]

This apparent unanimity is seen on examination, however, not to exclude very considerable differences in meaning. Such commonly-accepted positions have often appeared in the past development of philosophy. But they always prove nodes of intersection, rather than common conclusions. The various lines of thought unite in them only to immediately diverge, each on its own path, some to successfully urge their way to a higher level, and others to end, as it were, in a blind alley. It is as such a fresh point of departure that the 'unreality' of science seems to appear at present. All recognize it ; but its meaning varies with the perspective of the various schools and teachers.

One division among those who profess this opinion may be stated at once. It does not necessarily follow — though this seems sometimes to be overlooked — that, if we hold science to be abstract and unreal, we must necessarily contrast this abstractness and unreality with the reality of an *immediate* experience, a *reine Erfahrung*. We may describe reality in other terms than this, and still hold that the constructions of science are in some sort unreal. The contrast of the complete with the incomplete experience is equally available. Nevertheless, in many cases these portions are connected, and appear, explicitly or implicitly, as interdependent.

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[1] *Cf.* the address of the latter, cited in Ward, *Naturalism and Agnosticism*, 2d ed., Vol. I, pp. 305 ff.

Speaking generally, there would seem to be four typical schools of thought under which we may range those who hold that the descriptions of science are not descriptions of reality as it is. I am speaking, of course, of professed epistemologists and metaphysicians, not of those scientists who criticise the methods of their own science. These schools are voluntarism, the foremost representative of which at present is probably Professor Münsterberg; pragmatism, represented by Professors James and Dewey; positivistic sensationalism, as set forth by Ernst Mach and Karl Pearson; and absolute idealism, in its various shades of emphasis and meaning, as we find it held in common by such differing thinkers as, for instance, James Ward and Edward Caird.

It should be noted, however, that the adherents of idealism may vary greatly in the extent to which they hold that science is abstract and unreal. In the first place, they may regard different sciences as more or less abstract. This, however, is largely a question of detail. The more important difference concerns the meaning of this abstractness itself.

What may perhaps be called the orthodox party in this matter follows the example of Hegel in his discussion of the various categories. In the *Logic*, each category is seen as an imperfect statement of reality from the point of view of the one next beyond it in the advance towards the self-conscious idea. But that does not mean that it no longer has any reference to reality, or is abolished. Upon its proper level, it retains its validity. Were this not so, the next higher category would have no real content, since it appears as the completer realization of the lower. Accordingly, to cite the well-known example, when we pass from the standpoint of science to that of philosophy, from essence to the notion, freedom appears as 'the truth' of necessity, and yet as presupposing necessity. Again, when he discusses the necessary transition from mechanism to 'chemism,' and from 'chemism' to teleology, Hegel expressly states that the import of mechanism is universal, and not to be confined to the physical realm. In a word, to use the current formula, the contrast between the categories is one of 'degrees of reality,' of the more with the less complete, or adequate, statement. And it is in precisely the same spirit that the party of idealists to which I have referred would lay stress on the incomplete nature of scientific description, and yet hold that a correction of this is possible without destroying the first data. But there is now opposed to them a growing school which would refuse to admit that the scientific account of things is 'true as far as it goes,' and would insist that its inadequacy is not merely due to incompleteness or one-sidedness, but to a systematic intention to deal with reality only in a very indirect and artificial way, and for a very special purpose.

But, in spite of the large range of possible and actual variance in this matter, most idealists are united in rejecting any contrast of scientific thought with an immediate experience of any kind. This separates them clearly from voluntarists, pragmatists, and sensationalists alike. In so far, therefore, as the common position that the sciences do not give us reality in its concrete fulness is admitted, a criticism of the contrast with 'immediate experience' would seem to be an indirect apology for the more usual idealistic view.

In the case of the voluntarism of Professor Münsterberg, we have an elaborate exposition of a theory of immediate experience for which knowledge is a means to an end. This theory is quite familiar, and it will be sufficient to recall that according to it the immediately real world is one of volition. In it subjects and objects do not exist; they are valid, the subjects as wills and as attitudes, the objects as ends and means. The existential world is a product of the real wills, devised for the realization of certain of their purposes. Truth is thus a secondary product of reality, and knowledge is true, according as it meets the special purposes for which it is constructed.[1]

If, however, knowledge is such a special creation, the question arises: How are its results available for the real life in the service of which it is produced? Knowledge and the results of knowledge are unreal and abstract. Yet knowledge arises within concretely real experience, as a function of that experience. The results of its analysis must then in some way enlarge that experience, and guide its activities. Yet the objects of this analysis are unreal. How, then, can its results become part of the immediate reality?

There seem to be only two brief passages in which Professor Münsterberg deals directly with this difficulty. They occur in the *Grundzüge der Psychologie.*

In the first we are warned that we must not think that analysis adds anything to our knowledge of that immediately given reality — abstracted, of course, from its context — with which it begins. What it really does is to *create new realities.* This statement must mean, according to Professor Münsterberg's use of the term *reality*, that such products of analysis become objects — ends and means, that is, — in immediate experience.[2]

The second passage begins with the statement that the analysis and abstraction necessary in science do not destroy the unity of experience itself. It then continues as follows: "The fact that a certain chemical produces certain effects upon the organism may be discoverable only by scientific research, and remain unknown to most men. As soon as I know it, however, the expected effect is an object which unites itself with the perceived object, so that my action deals with both as one. . . . The original unity of experience is not shattered, therefore, when the conceptual analyses of the objective sciences begin. This [process] is only a deepening and enriching of experience. . . . Our concepts and judgments are unitary factors of experience, which are inseparable from the perceptions of immediate experience and surround them with a halo of interpretations and expectations, with logical overtones only to be perceived in isolation by the use of concept-resonators. The reality thought in concept is no longer pure experience; but the reality of the educated man, filled with such concepts, is just as much pure experience as the conceptless existence of the unlettered." [1]

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[1] *Cf. Grundzüge d. Psych.*, pp. 23 ff., 45 ff. *Psychology and Life*, pp. 23, 31, 97 ff., 198–199, etc.

[2] *Grundzüge*, pp. 57–58.

The meaning of these passages appears to be this: The objects of science are, it is true, unreal and abstract, secondary. But its judgments and its concepts are parts of immediate reality. A judgment, so Prefessor Münsterberg frequently insists, is really a will-attitude. However unreal the world of science is, therefore, the *conclusions* of the scientists are always included in immediate volitional experience. They neither augment nor diminish the reality of the originally given; for all we can say of the immediately real is, that it is so, and not otherwise. To admit the possibility of its modification by reinterpretation would be to deny its immediate reality. But what these conclusions do is to *amplify* immediate experience, to "deepen and enrich" it. We have more of it. The original objects, in themselves the same, are now surrounded by "conceptual halos," "logical overtones." And as this amplification is at the same time a change in our "expectations," it will involve a corresponding change in volitional attitude towards the objects.

In thus refusing to admit that there is any room for reinterpretation or for increasing organization in an *immediate* experience properly so-called, Professor Münsterberg shows a just sense of the implications of such a theory. His insistence on the primacy and immediacy of volition enables him the more readily to evade such an admission. Nevertheless, the evasion seems to be largely verbal. As far as results go, there would seem to be no difference between his 'amplified' experience, and the reinterpreted or more closely organized experience of the idealistic logician. The modification, whether of volition or judgment, which has taken place, cannot be described in terms of merely more or less.

Professor Münsterberg prefers to regard the judgment as a volitional attitude. From one point of view, it is rightly so regarded. But it is also something more. A judgment not merely states an attitude towards, or a demand upon, reality. It also describes, more or less explicitly, the structure of reality, in reference to which only the attitude or the demand has any meaning. No dividing line can be drawn in actual experience between cognition and volition ; the two are always interpenetrating and modifying each other. More accurately, the process of experience is cognitive and volitional alike. That growing purification from the merely personal, particular, and empirical which development involves on the side of knowledge, is equally present on that of will. Our purposes as well as our ideas clear up and steady as rational life advances, and, precisely because the process is essentially the same, the law of progress is the same on both sides. It is always an advance from a relatively incoherent and unorganized state, whether of volitions or of knowledge, towards a relatively coherent system. Both sides of our life are equally involved in this change, and there is no more immediacy to be found in the one than in the other.

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[1] *Op. cit.*, pp. 64-65.

Let us enlarge on this a little by returning to the text which has just been cited. From the point of view of the idealistic logician, our judgments about reality, at first comparatively separate and independent, become as our knowledge advances more and more systematized and interwoven, so that they approach an ideal limit at which the logical nexus is complete. The voluntarist prefers to use terms of purpose and will. Let us for the moment concede this to him. But is it not equally true, when we examine the matter, that the change in volitional attitudes that accompanies the 'amplification' of immediate experience which Professor Münsterberg describes, is in the direction of an increasingly systematic organization of our volitions ? At first they stand side by side, comparatively unrelated. But the changes which take place as experience enlarges involve increasing correlation and adjustment. To take an example suggested by his own of the chemical element : In a relatively non-scientific stage of experience, I might desire to eat all things indiscriminately which were pleasant to the taste. At the same time, I would have a desire for life much stronger than that for pleasant tastes, though normally it would not be prominent in consciousness. Enlarged experience might teach me the conflict of these two desires. The result, then, of its increasing range, and of the accompanying changes in volition, would be a closer organization of these two volitions. The desire for pleasant tastes would be brought into conscious subordination to the desire for life, and whatever in it conflicted with the more inclusive desire would be eradicated. Similar examples might be multiplied. They are most striking, of course, in the history of the adjustment of the 'selfish' to the 'altruistic' desires in the social life of mankind. As experience develops, the primitive volitions do not remain the same, any more than do the primitive judgments. What takes place is not a mere addition to them of other volitions, equally 'immediate,' but a profound modification of both new and old. And this modification is a constant process of mediation and organization. Nowhere in it can we find any absolute immediacy, or any contrast in this respect with cognition. Indeed, the growing organization which I have described is really the same on both sides, and usually we can express it at our option in terms of either.

The voluntarists can hardly look for an abler expositor than Professor Münsterberg. Since his argument fails at this most important point, it seems fair to assert that the notion of an *immediate* experience is equally untenable, whether one prefers the intellectualistic or the voluntaristic emphasis. Its adherents are equally unable, in either case, to state what they mean by it without really abandoning the notion. It is true enough that experience has at all times an immediate aspect; but this immediacy is merely relative. Experience is a process, one throughout, no portion of which can be contrasted as absolutely immediate or concrete with another as mediate or indirect. What we really find is a difference in degree of concreteness or organization, and the later stage is always the product of mediation. Therefore we can say that immediacy in any valuable sense is always the result of preceding mediation. If the ethical ideals and volitions of the civilized man differ from those of the savage, both in adequacy and clearness, this difference is the result of a long history of the adjustment and organization of competing impulses and desires. But those ideals may be said to be more 'immediate' than those of the savage, inasmuch as they are far more definite and individual. Again, the sense-experience from which the scientific experimenter takes his data is certainly quite as 'immediate' to him as that of the untrained observer is to him. But it is more valuable for his purposes, because it has been more completely organized; which is what we mean when we say that he chooses the 'significant' facts, and brings them to bear on one another. Both in volition and cognition, then, immediacy is a purely relative thing, and the more mediation underlies it the more useful it is.

Now this criticism seems to apply to the pragmatist as well, provided he would carry through his teaching to a consistent conclusion. He also, like the voluntarist, holds to an immediate experience, in the course of which thought appears when it is needed to solve a problem, or when it is useful. "Thinking," he tells us, "is adaptation to an end through the adjustment of particular objective contents."[1]

How are we to understand such statements as these? The question at once arises: What is it that sets this end? Is it, on the whole, one which is determined by the nature of the thought-process itself, and internal to it? Can we assume that this is what is meant when the problem is stated as "the restoration of a deliberately integrated experience from the inherent conflict into which it has fallen"?[2] If this were the meaning of the pragmatist, the statement would be quite true, but not very new, save for the terms employed. Every step in the dialectic of Hegel's *Logik* might be defined as the exposition of such an "inherent conflict" and of the "deliberate integration" which it necessitates. That thought is a purposive activity, striving toward the realization of an end immanent in itself, and nowhere finding anything entirely foreign to itself in this striving, is the historical teaching of idealism. In so far, therefore, as the pragmatist insists from this point of view upon the functional unity of experience, the idealist sees in him an ally rather than an opponent, as has recently been emphasized in the pages of this REVIEW by Professor Creighton.[1]

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[1] Dewey, *Studies in Logical Theory*, p. 81.

[2] *Ibid.*, p. 47.

But, on the other hand, in so far as the end or purpse of thought is taken by the pragmatist to be external to thought, and presented to it as a datum from an immediate experience of some kind, there would seem to be only two courses open to him. If he chooses to remain an epistemologist, he must describe this immediate experience which sets the ends for thought. Sense, feeling, will are the terms at his command for this description ; but of these he must make especial use of the last, since he has to account for purposes and ends. In a word, pragmatism, in completing itself as an epistemology, must pass over into voluntarism.[2] In so doing, it is equally open to criticism ; the unity of will and thought must be admitted — I have already dwelt upon it — but that "it all comes to immediate experience," [3] in any sense of immediate other than that already conceded, cannot be granted. Will and thought are equally immediate ; but they are also equally mediate. If will sets ends for thought, it is also equally true that thought sets ends for will. In neither case does this 'end-setting' come from without, since both are aspects of the same process. The argument need not be repeated. It is enough to say that to the present writer the theory of the pragmatist seems to break down at the same point as that of the voluntarist, that is, at the transition from the supposed immediate experience to the 'dependent' and 'secondary' process of thought.

Unfortunately, there seems also to be a tendency either to ignore this problem of immediate experience altogether, or else to evade it by appealing to biology. In the latter case, the ends of thought are described as set for it by the nature of the 'struggle for life,' and reason is regarded as a tool which has 'survival value.' It is unnecessary to point out that such a theory really throws epistemology aside, and takes refuge in an uncritical realism. As metaphysics, biological pragmatism is no more respectable than any other form of naturalism.

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[1] Vol. XV, p. 483.

[2] Professor James illustrates this ; but I would refer especially in this connection to the recent address of Professor Dewey, "Beliefs and Realities." See this REVIEW, Vol. XV, pp. 113 ff., esp. p. 124.

[3] *Loc. cit.*

No detailed criticism of the sensationalism of Mach and Pearson can be given here. The reputation of both is based upon achievements in other fields than that of epistemology, and it is quite safe to assume that this point of view is not seriously held by philosophical scholars at present. As an epistemological theory, it is thoroughly uncritical, and begs questions on all sides. Pearson explains both the particular perception, and the adaptation of conception to perception, by natural selection.[1] Both Pearson and Mach either take the organization always found in the data of knowledge, at however early a stage, for granted, or else explain it by a crude associationism,[2] the laws of which are again determined by survival value. In neither case, of course, are we given any adequate account of the immediate experience for the service of which thought is supposed to exist.

We return, accordingly, to idealism. I said in beginning that a rejection of the three theories involving some form of immediate experience would be after a fashion an indirect proof of the more usual idealistic theory, as that was the only important school of epistemology not holding such a view of experience which maintained the abstractness of science — and this abstractness we took as an admitted truth. But it should be noted also, that the acceptance of idealism sets a limit to the degree to which we can assert this abstractness. Scientific thought is for the idealist a part of the thought-experience as a whole, within which there are wide differences of concreteness, but no contrast of the merely abstract with the fully concrete. Nevertheless, as has already been noticed, very wide differences of opinion are possible among idealists as to the extent to which the results of science are available for the use of a constructive metaphysics. It may be well, in conclusion, to contrast briefly the radical view in this matter with the conservative. The radical would urge, as we have seen, that science is admittedly better science, the more abstract it becomes. It does not pretend, when it knows its own business, to describe reality as it is, but aims rather at a conceptual summary which is an artificial means devised for very special purposes of control within a carefully limited field. It may well be, therefore, that only the knowledge of the general methods and norms of thought gained in the work of the several sciences can be used in our final account of reality, while their special objective results must be rejected, as of no validity, except for the particular purposes of the science which states them.

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[1] *Grammar of Science*, 2d ed., pp. 102 ff.

[2] *Cf.* Mach, *Analysis of the Sensations*, Engl. transl., pp. 20–21, etc., and Pearson, *op. cit.*, pp. 40, etc.

Now there are many things to be said in favor of such a view. It is true, in the first place, that every science is a special construction. It commences by isolating a certain group of phenomena as its subject-matter. Thus physics deals with the phenomena of motion, and psychology may explicitly put on one side the problem of mind to deal with mental processes as phenomena. In considering such isolated phenomena, science assumes certain definitions as its necessary points of departure; and, as in the case of theoretical mechanics, these definitions are often highly artificial and not based on any definite actual experience. Once at work, it often employs hypotheses and conceptions which are admittedly of only methodological and instrumental validity, useful to organize and control its data for the time being. Such, for instance, is the more usual view taken by psychologists of the parallelistic hypothesis, or by physicists of the conception of a primordial ether. As a result of all these restrictions, the results of science are valid only 'under the rules of the game'; that is to say, as in the case of geometry, only when the particular conventions essential to its method and subject-matter are presupposed. And this view of the question seems to be borne out by the history of the sciences. The more sophisticated and aware of their proper task they become, the more they divorce themselves from metaphysics, and give up any claim to get beyond the phenomenal. So that at present many among scientists themselves regard their science as 'merely descriptive,' as having only economic validity in summing up observed phenomenal sequences.

But this view of the sciences has other reasons for its prevalence than the strictly logical and historical. It is attractive to many because it seems to offer a royal road, so to say, to the metaphysician. It would seem to absolve him from finding a place for mechanism in his final account of the universe. He is not obliged to make causal determination universal, and then laboriously arrive at a freedom for which this mechanism is but a universal means of expression and realization. Thus he can avoid the difficulties which many feel in accepting such strict Neo-Hegelian views as, for example, those of Edward Caird. That such a view is oppressive to many minds is certain ; Professor James, for example, has voiced his discontent at a freedom which is everywhere and nowhere. Undoubtedly this consideration has been one of the sources of the popularity of the radical view, particularly as set forth by the adherents of voluntarism.

Nevertheless, there are some weighty arguments for the conservative view, which I can here only briefly touch upon. We must admit, in the first place, that science does claim to be in some sense an adequate description of the facts. However much a construction it may be, it is not an *arbitrary* construction. In so far, therefore, as it is based on the laws of experience in general, its results must be considered in any attempt to give a final account of that experience and its meaning. Of so much we may be sure, though this does not exclude a very radical transformation of those results in that final account. It is but stating this in another form to urge that, however hypothetical the judgments of science may be, they necessarily have a categorical basis of some kind. More concretely, science is true, even as construction, because it constructs *within* a reality of given, definite nature. It solves its problems because the conditions are definite, and it meets them. Every valid solution is, therefore, implicitly a statement of the nature of those conditions, and, as such, material for the metaphysician.

It must also be urged that no absolute separation between scientific and other experience is possible. The sense of reality is the same in both, however it may vary in degree, and there is a constant interplay between our scientific knowledge and our attitude towards reality in general. The one is profoundly affected by the other. The classic instance of this is the effect of the transition from the Ptolemaic to the Copernican astronomy ; but it is sufficiently apparent in less striking cases. We do not carry our scientific judgments about with us quite separately from our attitude towards 'concrete reality' or 'living experience.' Science and the rest of life do not merely coexist, but make one whole of experience. The passages from Professor Münsterberg which I have just been discussing admit this interplay fully, and all of the criticism thus far advanced is an argument for it. But if the results of science have this vital significance in our experience, they cannot be excluded from the data of the metaphysician.

It seems, then, that Hegel has set forth the most profitable way of approaching this problem. The sciences are not superseded or rejected by metaphysics. On their own level, they retain their relative truth as accounts of reality. As steps in the movement of thought — concrete thought, which is both knowledge and will — towards its goal, they find the correction of their abstractness and incompleteness in that more adequate standpoint which it is the duty of philosophy to at least attempt to describe. In so far, therefore, as the advance of the belief that the sciences are abstract, among both scientists and epistemologists, means a clearer perception of their tasks on both sides, it is a welcome sign of the times. But if the attempt is made to open the way for metaphysics to entirely disregard the results of science, it can only end in the impoverishment of the former. We have a curious paradox, if 'humanism' seeks to exclude from the data of the philosopher a large part of the historically human in experience, and to make a gap between science and morals, between life and knowledge.

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